

IN THE CLAIMS

Please amend the claims as follows.

For the Examiner's convenience, a list of all claims is included below.

1. (Currently Amended) A method comprising:
forming a cleave layer in a substrate, wherein the cleave layer comprises silicon-germanium (SiGe), and the substrate comprises silicon;
impinging laser energy on the ~~the~~ [[a]] substrate; and
effecting laser-induced cleaving along the cleave layer ~~of a~~ by performing at least one of:
stoichiometrically ~~designing~~ adjusting a composition of a Ge content in a SiGe material
to form the ~~the~~ [[a]] cleave layer in the substrate to match a bond breaking energy involving the
SiGe material to a laser energy characterized by a laser wavelength; and
selecting the laser wavelength to provide the laser energy to substantially match a bond-breaking threshold energy of the material, based upon at least a stoichiometric composition of
the SiGe material of the cleave layer, wherein the laser wavelength is tuned to provide the laser energy to be greater than a band gap of SiGe and smaller than that of Si.
- 2 - 4 (Canceled)
5. (Previously Presented) A method as claimed in claim 1, wherein the laser energy induces selective bond breaking at an interface of a host material of the substrate and the material of the cleave layer, to effect the laser-induced cleaving of the substrate substantially along interface.
6. (Canceled)

7. (Currently Amended) A method as claimed in claim 1, comprising predetermined balancing of a stoichiometric composition of the material of the cleave layer ~~verses~~ versus a predetermined laser energy to effect a predetermined cleave yield.
8. (Previously Presented) A method as claimed in claim 1, comprising:
bonding the substrate to a receiving substrate prior to the laser-induced cleaving, wherein upon the laser-induced cleaving, a layer cleaved from the substrate remains bonded to the receiving substrate.
9. (Currently Amended) A method comprising:
~~effecting laser induced cleaving of a substrate by using simultaneous application of~~
simultaneously applying a plurality of interfering laser beams to a substrate ~~effect a laser~~
~~energy to effect the laser induced~~ induce cleaving of the substrate substantially along a laser-defined cleave plane; and
designing a profile of a laser energy interference pattern along a thickness of the substrate
to determine a depth of a desired cleave plane relative to a surface of the substrate.
10. (Previously Presented) A method as claimed in claim 9,
wherein the plurality of interfering laser beams have at least one of specifically tuned energies, incidence angles, and space profiles, to define a desired cleave plane.
11. (Canceled)
12. (Original) A method as claimed in claim 9, comprising:

effecting a predetermined material within the substrate to form a predetermined cleave layer, within which the laser-induced cleaving is to be effected.

13. (Original) A method as claimed in claim 12, wherein the substrate comprises silicon (Si), the predetermined material comprises germanium (Ge), and the laser energy is tuned to be greater than a band gap of SiGe but smaller than that of Si.

14. (Original) A method as claimed in claim 12, wherein the substrate comprises silicon (Si), the predetermined material comprises hydrogen (H), and the laser energy is infrared laser energy.

15. (Original) A method as claimed in claim 12, wherein the laser energy induces selective bond breaking at an interface of a host material of the substrate and the predetermined material, to effect the laser-induced cleaving of the substrate substantially along the interface.

16. (Previously Presented) A method as claimed in claim 12, comprising at least one of:
stoichiometrically designing a composition of the material to substantially match a bond breaking energy involving the material, to the laser energy; and
selecting the laser wavelength to provide the laser energy to substantially match a bond-breaking threshold energy of the material, based upon at least a stoichiometric composition of the material.

17. (Currently Amended) A method as claimed in claim 16, comprising predetermined balancing of a stoichiometric composition of the material of the cleave layer ~~verses~~ versus a predetermined laser energy to effect a predetermined cleave yield.

18. (Original) A method as claimed in claim 9, comprising:

bonding the substrate to a receiving substrate prior to the laser-induced cleaving, wherein upon the laser-induced cleaving, a layer cleaved from the substrate remains bonded to the receiving substrate.

19. (Original) A method as claimed in claim 1, comprising:

impinging the laser energy on at least one side edge of the substrate in a side-cut mode in effecting the laser-induced cleaving.

20 -22 (Canceled)

23. (Previously Presented) A method as claimed in claim 19, wherein the laser energy induces selective bond breaking at an interface of a host material of the substrate and the material, to effect the laser-induced cleaving of the substrate, substantially along the interface.

24. (Canceled)

25. (Currently Amended) A method as claimed in claim 19, comprising predetermined balancing of a stoichiometric composition of the material ~~verses~~ versus a predetermined laser energy to effect a predetermined cleave yield.

26. (Original) A method as claimed in claim 19, comprising:

forming micro-voids in the substrate prior to impinging the laser energy on the at least one side edge of the substrate in the side-cut mode, and effecting the laser-induced cleaving along cleave plane defined by ones of the micro-voids.

27. (Previously Presented) A method as claimed in claim 26, wherein the substrate comprises silicon (Si), wherein the micro-voids are formed by implantation of at least one of hydrogen (H), H₂ and helium (He) into the substrate, and subsequent annealing of the substrate.

28. (Previously Presented) A method as claimed in claim 19, comprising:
bonding the substrate to a receiving substrate prior to the laser-induced cleaving, wherein upon the laser-induced cleaving, a layer cleaved from the substrate remains bonded to the receiving substrate.

29. (Original) A system comprising:
at least one item selected from a list of: an electronic package, PCB, socket, bus portion, input device, output device, power supply arrangement and case; and
at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 1.

30-32 (Canceled)

33. (Original) A system comprising:
at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and
at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 5.

34. (Canceled)

35. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 7.

36. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 8.

37. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 9.

38. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 10.

39. (Canceled)

40. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 12.

41. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 13.

42. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 14.

43. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 15.

44. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 16.

45. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 17.

46. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 18.

47. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 19.

48-50 (Canceled)

51. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 23.

52. (Canceled)

53. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 25.

54. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 26.

55. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 27.

56. (Original) A system comprising:

at least one item selected from a list of : an electronic package, PCB, socket bus portion, input device, output device, power supply arrangement and case; and

at least one silicon-on-insulator semiconductor device manufactured through use of at least the method of claim 28.